The Pre-hospital Care System

Optimizing Care for the Head and Spinal Injured Patient

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History

- Paramedics in the United States started in the late 60's
- Los Angeles was one of the first Counties to have paramedics

TRAUMA and the MILITARY

- Wars in Korea and Vietnam
  - Trained many paramedics who continued in the profession after returning to civilian life
  - Proving ground for innovative medical and surgical management

Los Angeles Emergency Medical Services "EMS"

- 34 Public Paramedic Providers
- 16 Private Paramedic
- More than 3k Paramedics

L.A. EMS

- **3 Public Helicopter Providers**
- **1 Private Helicopter Provider**
- **2 Military Helicopter Providers**
- **3 EMS Watercraft Providers**

Los Angeles Trauma System

- **13 Designated Adult Trauma Centers**
- **7 Designated Pediatric Trauma Centers**

Specialized Trauma Training

- PHTLS
- ITLS

Field Head and Spinal Injury Treatment

- Do not stay on scene for more than 10 minutes with a critical trauma patient

Treatment

- **Consider advanced airway / Ventilation**
  - **BVM**
  - **ET**
  - **King Airway**
  - **DO NOT Hyperventilate Head Injury Patients ($ETCO_2$ < 35)**
  - **NO RSI or Sedition Intubation in LA County**

Treatment

- Spinal immobilization
  - Backboard and c-collar
  - Extrication device
  - Rapid extrication

  - ***<u>NOTE:</u> Do not delay hypotensive patients with penetrating torso trauma in order to apply spinal immobilization***

Withholding Spinal Immobilization

Indications for NOT immobilizing the spine…

No **mechanism**

No **pain**

Treatment

- IV access enroute
  - 2nd I V if possible
  - LA County currently does not allow for I.O. in trauma patients
  - Consider fluid resuscitation based on blood pressure

Base Station Hospital

- **In significant head and spinal injuries paramedics work under standing orders**
- **Base Station coordinates and assists in getting patient to destination**

Triage to Trauma Center

- No Airway obstruction
- 30 Minute criteria, ground ambulance

Triage Protocol Modified for Head and Spinal Injuries:

TRANSPORT TO A TRAUMA CENTER! (1)

- Systolic Blood Pressure less than 90 mm/Hg
  - 70 mm/Hg in infants less than one year
- Respiratory Rate greater than 29 per minute OR less than 10 per minute
  - Less than 20 per minute in infants
- All penetrating injuries to the head, neck

TRANSPORT TO A TRAUMA CENTER! (2)

- **Blunt head injury associated with**
  - **suspected skull fracture**
  - **altered level of consciousness (GCS < than or equal to 14)**
  - **seizures**
  - **unequal pupils**
  - **or focal neurological deficit**

TRANSPORT TO A TRAUMA CENTER! (3)

- Injury to spinal column associated with acute sensory or motor deficit
- Falls greater than 15 feet
  - Pediatrics greater than 10 feet or 3 times height of child

TRANSPORT TO A TRAUMA CENTER! (4)

- **Passenger space intrusion of greater than 12 inches occupant site, or greater than 18 inches into any other passenger space**
- **Ejected from vehicles**
  - **Partial or complete**

TRANSPORT TO A TRAUMA CENTER! (5)

- **Auto vs pedestrian/bicyclist/motorcycle thrown, run over, or with greater than 20 MPH impact**
- **Unenclosed transport crash with greater than 20 MPH impact**

- **Consider the following Guidelines**
  - **Injured victim of vehicular crash in which fatality occurred in the same vehicle**
  - **Patients requiring extrication**
  - **Vehicle telemetry warning system activated**
  - **Patients on anticoagulants or bleeding disorders**

- **Special considerations**
  - Adults over 55 years of age
  - Systolic blood pressure < 110mm/Hg in patients with hypertension history
  - Pregnancy greater than 20 weeks
  - Paramedic Judgment

Los Angels County EMS Challenges

- Venous access in significant trauma patients in a urban setting
- PHC advanced airway management
- System Issues
  - Hospital closures
  - Emergency Departments overcrowding
  - Overwhelmed trauma centers

Prehospital Rapid Sequence Intubation Improves Functional Outcome for Patients with Severe Traumatic Brain Injury Randomized Controlled Trial

Annals of Surgery

Toronto prehospital hypertonic resuscitation – head injury and multiorgan dysfunction trial: Feasibility study of a randomized controlled trial

Journal of Critical Care
2011

Cervical Spine Motion During Extrication

Journal of Emergency Medicine
2013

High-Dose Steroids for Acute Spinal Cord Injury in Emergency Medical Services

Position Paper
National Association of EMS Physicians

Pre-Hospital Care

Thank You

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